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ABSTRACT

The state of Illinois is encouraging schools to better inspect and evaluate the causes of their pest infestation problems through use of the Integrated Pest Management (IPM) guidelines developed by the Illinois Department of Public Health. This guide reviews the philosophy and organization of an IPM program for structural pests in schools, identifies ways to reduce dependence on pesticides in school buildings, and discusses alternative methods for pest management. It offers a step-by-step methodology for establishing an IPM program in schools that includes educating and training of staff, inspecting and monitoring for potential problems, setting action threshold levels for pest control conditions requiring remedial action, applying IPM strategies to control pests, and evaluating results. It is noted that these guidelines are not for lawn and turf pests. Appendices provide examples of a school pest management policy statement and pest management specification. (Contains 17 references). (GR)

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Preface

In 1992, Governor Edgar signed an amendment to the Structural Pest Control Act (225 ILCS 235 et seq., formerly Ill. Rev. Stat., ch 111 1/2, par. 2201 et seq.) to promote ***Integrated Pest Management*** (IPM) in schools. This act was passed in response to concerns that too many schools rely on routine chemical applications at the exclusion of other measures for control of pests. The purpose of this ***voluntary*** program is to encourage IPM by making guidelines on IPM available to schools. A successful IPM program requires better inspections and evaluations of the causes of pest infestations, which in turn requires a better-trained staff. Often, schools do not have staff with knowledge of the biology and control of pests to conduct or contract for a successful IPM program. The Illinois Department of Public Health developed these guidelines on structural IPM in consultation with the Structural Pest Control Advisory Council, the U.S. Environmental Protection Agency, the Illinois Department of Agriculture, the University of Illinois Cooperative Extension Service and other agencies and organizations. School district personnel should use this document as a general guide for developing an IPM program for their school.

INTEGRATED PEST MANAGEMENT (IPM) AND YOUR SCHOOL

Public concern about health and environmental risks associated with pesticides is increasing, particularly when children are involved. This has resulted in increased interest in the use of equally effective alternative pest control methods. School administrators and other persons who have pest control decision-making responsibilities for school buildings and grounds should become aware of the pest control options available to them. It is in everyone's best interest to reduce exposure to potentially harmful chemicals.

The Illinois Department of Public Health (IDPH), in cooperation with the U.S. Environmental Protection Agency (USEPA), the Illinois Department of Agriculture, and the University of Illinois Cooperative Extension Service, prepared this document to acquaint you with ***Integrated Pest Management*** (IPM), an alternative approach to traditional pest control. IPM can reduce the use of chemicals and provide economical and effective pest suppression.

This guide has also been developed to encourage school officials to examine and improve their pest management practices -- and to assist them in doing so. It reviews the philosophy and organization of an IPM program for structural pests in schools, identifies ways to reduce dependence on pesticides in school buildings, and discusses alternative methods for managing structural pests common to schools. School officials are not, however, required by law to adopt the practices recommended in this guide.

This guide is not intended to discuss prevention and control of specific structural pests in detail. For further information on prevention and control of a specific pest, consult *Truman's Scientific Guide to Pest Control Operations*, *Urban Integrated Pest Management*, and other references listed on pages 12 and 13. This guide does not discuss IPM of lawn and turf pests; contact the University of Illinois Cooperative Extension Service for further information on that topic.

WHAT IS INTEGRATED PEST MANAGEMENT?

Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interactions with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property and the environment. IPM programs take advantage of *all* pest management options possible, including the judicious use of pesticides.

Understanding pest survival needs is essential to implementing IPM effectively. Pests seek habitats that provide basic needs such as air, moisture, food and shelter. Pest populations can be prevented or controlled by creating inhospitable environments. This can be accomplished through the removal of basic elements pests need to survive or by simply blocking their access into buildings. Pests may also be managed by other methods such as traps, vacuums or pesticides.

ESTABLISHING AN IPM PROGRAM IN SCHOOLS

An efficient IPM program can be integrated with a school's existing pest management plan and other school management activities. School management activities such as preventive maintenance, janitorial practices, landscaping,

occupant education and staff training are all part of an IPM program. The following steps are an example of how an IPM decision network can be developed:

STEP 1: Develop an official IPM policy statement. This useful first step in making the transition from a conventional pesticide program to an IPM program goes beyond simply stating a commitment to support and implement an IPM approach. It acts as a guide for the pest manager to use in developing a specific IPM program.

STEP 2: Designate pest management roles for occupants, pest-management personnel and key decision-makers, and assure good communication among them. Educate and train people for their respective roles.

STEP 3: Set pest management objectives for the site(s). For every site, pest management objectives will differ. The type of pest management should be outlined.

STEP 4: Inspect site(s) and identify and monitor pest populations for potential problems.

STEP 5: Set action thresholds. These are the levels of pest populations or site environmental conditions that require remedial action.

STEP 6: Apply IPM strategies to control pests. These include redesigning and repairing structures, improving sanitation, using traps and applying pesticides judiciously.

STEP 7: Evaluate results to determine if pest management objectives are reached and keep written records of all aspects of the program.

STEP 1

Developing an Official Policy Statement for School Pest Management

A policy statement for school pest management should state the intent of the school administration to implement an IPM program. It should briefly explain what is expected -- the incorporation of existing services into an IPM program and the education and involvement of students, staff and pest manager. (See Appendix I for an example policy statement.)

STEP 2

Designating Pest Management Roles

The concepts and methods of IPM were developed originally in agricultural settings. Later, it was found that the IPM concept could be applied to a wide range of pest problems, including control of pests in structures such as school buildings. ***One of the most important points to remember is that the interaction among the people involved in a school pest management system is the key to the success or failure of an IPM program.*** When the respective roles of all the people in the pest management system are identified and agreed upon, and when these people communicate with each other, effective and less expensive protection of the site and the people can be achieved with reduced risk. In successful urban pest management systems, people function effectively as occupants, pest managers or decision-makers, gaining the information they need, providing the information that others need, cooperating with each other and meeting their special responsibilities to achieve the unique pest management objectives of the site. These functions and responsibilities are identified below and should be outlined in the school's pest management plan.

Students and Staff – The Occupants

Occupants are concerned about the safety of the pest control methods used, their effectiveness and possible adverse effects. School staff, students and their parents should receive information addressing these concerns and their roles in the school's pest management system. The most important responsibility of the students and staff is sanitation. Much of the prevention and reduction of pest infestations at the school site depends on whether both students and school staff cooperate to cleanup food leftovers, food in lockers, gum under desks, paper clutter, etc. In addition, when people at the school site observe the presence of pests, it should be reported. Other actions may be required of, or be undertaken by, students and staff depending upon interest in the site and the pest management system. The more occupants "buy in" to this, the better the pest management system will work. It is important to note that unreasonable demands for a totally pest-free building or pest control without the use of any pesticides can cause an IPM program to fail.

Parents Have Special Roles to Play Too

Parents have the most responsibility for their children and they are their children's natural advocates. Parents' first school pest management responsibility is to learn about and follow IPM practices at home so that pests are not carried to the school site in notebooks, lunch boxes, clothing or children's hair. Second, parents should be aware of the current pest management practices in their children's schools. The schools should welcome questions by the parents and encourage the parents to seek information about IPM. Visible interest and concern by the parents are valuable resources for the implementation of a school IPM program. Parents may express their views to the school superintendent, school board, school district management and parent-teacher organizations or associations. Parents may participate on IPM advisory or oversight committees with school and government management.

Managing the Pests – The Pest Manager

In a pest management system, the pest manager is the person who observes and evaluates (or directs others to do so) the site and decides what needs to be done to achieve the site pest management objectives. The pest manager designs a pest management system that considers potential liability, applicator and occupant safety, costs, effectiveness, time commitment, and customer or occupant satisfaction. The pest manager draws on knowledge gained through prior training and uses information on the site, the pest and its biology, occupant health and concerns, appropriate control measures and expected results. The pest manager also performs the necessary pest management actions or directs others in the actions to be taken. Since the pest manager usually has the responsibility of keeping both the occupants and the decision-makers (management) informed, he or she has the greatest need for available information about the site, pest and appropriate pest management methods. The system for the site must achieve the goals within the limitations posed by safety, time, money and materials available. The pest manager monitors the site and the pest population to determine if actions taken are successful, and keeps accurate records of the amount, location and dates of use of any pesticides.

Decision-Makers

Generally, persons who authorize the pest management program and control the money for pest management are people who are involved in the direct management (or administration) of the school, such as a superintendent or assistant superintendent of schools. However, a person indirectly involved with the site may become a pest management decision-maker, e.g., the health department inspector. On other occasions, the purchasing agent or contracting officer for a school system or district may be a major decision-maker for a school site. At this level of pest management decision-making, concerns about costs, liability, time expended, method effectiveness, safety and customer or occupant satisfaction are foremost. These decision-makers also determine if the pest manager is performing at an acceptable level and if the pest management objectives are being met. Among other methods, this can be done by monitoring complaints from the occupants, by observation of the site environment, or by a combination of both. Decision makers must also provide the necessary level of financial commitment for any IPM program to succeed. Much understanding, cooperation and commitment from everyone in the system – students and parents, school staff, managers, administrators and the public – is needed for an IPM program to succeed.

Educating IPM Participants

A school IPM program should include a commitment to the education of the students, staff and parents. This education should include not only the teachers, but school nurses, cafeteria employees and housekeeping and administrative personnel as well. All staff at the school should learn about the basic concepts of IPM and how these principles are being applied in their particular school. Staff and students will need to understand how their own behavior can increase or reduce pest problems. School staff should encourage the parent-teacher association and other school-affiliated student organizations to participate in the IPM program. Specific instructions should be provided on what to do and what not to do. For example, staff should not bring and use their own pesticides at school sites, move sticky traps or other pest monitoring devices, or prop open windows or screens in kitchens. All pesticide products, including those purchased at a retail store, should only be applied by qualified personnel. Educating and training staff to function within an IPM context is important to the success of an in-house IPM program. [Note: More specific training is required for the pest manager. Information about sources of training materials can be obtained from IDPH, the University of Illinois Cooperative Extension Service, the Illinois Pest Control Association and Purdue University.] Education is a vital component of pest management. Many schools across the United States have incorporated environmental issues into their curricula. Science classes could include discussions and activities to learn more about the fascinating and diverse roles of insects, plants, rodents and birds in our world. Most are harmless and many are actually beneficial in controlling pest populations. However, the presence of predatory insects, spiders, mites and similar organisms is usually not desirable in occupied buildings. If good sanitation is practiced, the population of these insects can be kept at tolerable levels.

STEP 3

Setting Pest Management Objectives for Sites

Pest management objectives will differ for most sites and must be considered before establishing action threshold levels. With buildings or other structures, the main objective might be controlling damage caused by termites. Schools should outline specific objectives in a pest management plan. Examples of pest management objectives include:

1) Managing pests that may be found on school sites to prevent interference with the learning environment of the student;
2) Eliminating injury to students, staff and other occupants; and
3) Preserving the integrity of the school buildings or structures.

STEP 4

Inspecting, Identifying and Monitoring

An IPM program consists of a cycle of inspecting, identifying, monitoring, evaluating and choosing the appropriate method of control. Routine inspection and accurate identification of pests are vital steps in IPM to ensure that control methods will be effective. Once the pest has been identified and the source of its activity pinpointed, habitat modifications -- primarily exclusion, repair and sanitation efforts -- may greatly reduce the prevalence of the pest. Monitoring includes inspecting areas for pest evidence, entry points, food, water and harborage sites, and estimating pest population levels. The information gained through monitoring is evaluated to determine whether the action threshold has been exceeded and what can be done in the way of prevention.

STEP 5

Setting Action Thresholds

An ***action threshold*** is the level at which action is initiated for each pest. It is determined by deciding how many pests can be tolerated by school occupants. Action thresholds are set by the pest manager and the occupants and should

reflect pest management objectives for the site. ***The presence of some pests does not necessarily require application of pesticides.***

When pest populations exceed action thresholds, action must be taken. Precise recommendations or actions to achieve specific results are an essential part of an IPM program. Specific recommendations, including an explanation of the benefits, should be based on the evaluation of all available data obtained through inspecting, identifying and monitoring. An ***example*** of an action threshold hierarchy for German cockroaches is in Table 1.

Table 1 Action Thresholds for Control of German Cockroaches[1]

Average No. trapped per zone[2]	Action to be taken
0	None caught for 3 months, change monitoring to 2 months, and replace bait stations at 6 months;
1 - 2	Continue routine use of bait stations, check for any sanitation problems;
3 - 6	Crack and crevice application of locations next to the traps that had cockroaches, add or replace bait stations, review sanitation, check sanitation in 2 weeks;
7 - 15	Thorough crack and crevice treatment, review sanitation, place sticky traps for monitoring in 2 weeks;
15+	Close the facility and conduct a thorough inspection with a cockroach-flushing aerosol, spot and crack and crevice treatment, replace and increase bait stations, monitor every 2 weeks.

[1]After Robinson and Snell, 1991. [2]Each room or area monitored monthly for 24 hours with 3 to 5 sticky traps.

STEP 6

Applying IPM Strategies

Pest-preventive measures can be incorporated into existing structures. Such preventive measures reduce the need for pesticide applications and include sanitation and structural repair, using physical and mechanical controls such as screens, traps, air doors, etc. Specific IPM strategies for specific school sites are provided below. [Note: Every school will experience slightly different combinations of pests.]

IPM STRATEGIES FOR INDOOR SITES

TYPICAL PESTS: Mice, rats, cockroaches, ants, flies, wasps, hornets, yellow jackets, spiders, microorganisms, termites, carpenter ants and other wood-destroying insects. Although wasps, hornets, yellow jackets and spiders are beneficial as predators of some pests, stinging or biting arthropods can be troublesome or hazardous to students and staff.

ENTRYWAY (Doorways, overhead doors, windows, holes in exterior walls, openings around pipes, electrical fixtures or ducts.)

- Keep doors shut when not in use.
- Place weather stripping on doors and maintain tight door thresholds.
- Caulk and seal openings in walls and seal utility chases.
- Install or repair screens.
- Install air curtains.
- Keep vegetation, shrubs and wood mulch at least one foot away from structures.

CLASSROOMS AND OFFICES (Classrooms, laboratories, administrative offices, auditoriums, gymnasiums and hallways.)

- Allow food and beverages only in designated areas.
- If indoor plants are present, keep them healthy. Occasionally, indoor plants may be a source of pests. When small insect infestations appear, remove them manually. If mechanical removal is not possible, use insecticidal soaps or insecticides that are not volatile. It may be necessary to move the plant to an unoccupied room for treatment.
- Keep areas as dry as possible by removing standing water, and water damaged or wet materials.
- In the science lab, store animal foods in tightly sealed containers and clean cages regularly. In all areas, remove dust and debris.
- Clean lockers and desks routinely.
- Vacuum carpeted areas frequently.
- If students get head lice, consult your local health department and have their parents contact a physician. Discourage students from exchanging hats or caps at school.

FOOD PREPARATION AND SERVING AREAS (Dining room, main kitchen, teachers' lounge, home economics kitchen, snack area, vending machines and food storage rooms.)

- Store food and waste in containers that are inaccessible to pests. Containers must have tight lids and be made of plastic, glass or metal. Waste should be removed at the end of each day.
- Place screens on vents, windows and floor drains to prevent cockroaches and other pests from using unscreened ducts or vents as pathways.
- Create inhospitable living conditions for pests by reducing availability of food and water: remove food debris, sweep up all crumbs, fix dripping faucets and leaks and dry out wet areas.
- Improve cleaning practices, including promptly cleaning food preparation equipment after use and removing grease accumulation from vents, ovens and stoves. Use caulk or paint to seal cracks and crevices.

- Capture rodents by using mechanical or glue traps. [Note: Place traps in areas inaccessible to children. Mechanical traps, including glue boards, used in rodent control must be checked daily. Dispose of killed or trapped rodents within 24 hours.]

ROOMS AND AREAS WITH EXTENSIVE PLUMBING (Bathrooms, rooms with sinks, locker rooms, dishwasher rooms, swimming pools and greenhouses.)

- Promptly repair leaks and correct other plumbing problems to deny pests access to water.
- Routinely clean floor drains, strainers and grates. Seal pipe chases.
- Keep areas dry. Avoid conditions that allow formation of condensation. Areas that never dry out are conducive to molds and fungi. Increasing ventilation may be necessary.
- Do not store paper products or cardboard boxes near moist areas, directly on the floor, or against the wall. This also permits easy inspection.

MAINTENANCE AREAS (Boiler-room, mechanical room, janitorial-housekeeping areas and pipe chases.)

- After use, promptly clean mops and mop buckets; dry mop buckets and hang mops vertically on a rack above a floor drain.
- Allow eating only in designated areas.
- Clean trash cans regularly, use plastic liners and secure lids.
- Keep areas as clean and as dry as possible and remove debris.

IPM STRATEGIES FOR OUTDOOR SITES

TYPICAL PESTS: Rodents, insects and other pests may enter structures from the outdoors. Proper sanitation of outdoor areas helps prevent outdoor pests from gaining access to school buildings.

PLAYGROUNDS, PARKING LOTS, ATHLETIC FIELDS, LOADING DOCKS AND REFUSE DUMPSTERS

- Regularly clean trash containers and gutters and remove all waste, especially food and paper debris.
- Secure lids on trash containers.
- Repair cracks in pavement and sidewalks.
- Provide for adequate drainage away from the structure and on the grounds.

Applying Pesticides Judiciously

Many pesticides are available for use against urban and structural pests. Before application, the pest manager should consider the toxicity of the product and application techniques. Because excessive or improper application of pesticides

can cause injury, these materials should be applied by qualified applicators in a manner to ensure maximum efficiency with minimal hazard. Pesticides should be applied only when occupants are not present in areas where they may be exposed to materials applied.

Although the USEPA registers pesticides for use within the United States, registration should not be taken to mean that a particular pesticide is "safe" under all conditions of use. Read and follow the pesticide label directions, know how to apply and handle these chemicals and try to minimize the exposure to people and non-target species of animals and plants.

The following general recommendations should minimize exposure to people and other non-target species when the application of pesticides is considered:

- All pesticides used in Illinois must be registered by the USEPA and the Illinois Department of Agriculture.
- Read and follow all label instructions.
- If possible, choose a pesticide that is labeled for the specific site, intended for the pest you are trying to control, as target-pest specific as possible, rather than a broad spectrum pesticide.
- Limit the use of sprays, foggers and volatile formulations. Instead, use baits and crack and crevice application when possible. Look for crack and crevice label instructions on how to apply the pesticide. These treatments maximize the exposure of the pest to the pesticide while minimizing the pesticide exposure for the occupants.
- Place all rodenticides regardless of packaging either in locations not accessible to children and non-target species or in tamper-resistant bait boxes. Outdoors, bait should be placed only in tamper-resistant bait stations to prevent non-target animals from gaining access to the bait. Securely lock or fasten shut the lids of all bait boxes. Place bait in the baffle-protected feeding chamber of the box and never in the runway of the box.
- Apply only when occupants are not present or in areas where they will not be exposed to the material applied. After application of aerosols or sprays, ventilate the room thoroughly as indicated on the pesticide label or as required by other regulations. Note any re-entry time limits listed on the label and be aware that some residues can remain long after application.
- Use proper protective clothing or equipment when applying pesticides. Properly ventilate areas after pesticide application.
- If part of the school pest management policy, notify students, staff and parents of upcoming pesticide applications. Pay particular attention to individuals who may be at higher risk.
- Keep copies of current pesticide labels, consumer information sheets and Material Safety Data Sheets (MSDS) accessible.

Storing Pesticides

Store pesticides off-site or in buildings that are locked and inaccessible to all unauthorized personnel. Be sure adequate ventilation is provided for the pesticide storage area. Avoid storing pesticides in places where flooding is possible or in open places where they might spill or leak into the environment. Store flammable liquids away from an ignition source. Check for state recommendations and requirements for pesticide storage.

If pesticides are stored in occupied buildings, special care is necessary to ensure air does not get contaminated. Notice should be placed outside the designated storage area. All pesticides must be stored in their original containers and lids should be tightly secured. Make sure that childproof caps are properly fastened. However, even closed pesticide containers may volatilize toxic chemicals into the air. Therefore, pesticides should only be stored in spaces that are

physically separated and closed off from occupied spaces and where there is adequate exhaust ventilation (i.e. the air is exhausted directly to the outside). In addition, precautions are needed to ensure that the air in the storage space has no chance of mixing with the air in the central ventilation system.

The pest manager is responsible for periodically checking stored pesticide containers for leaks or other hazards. To reduce pesticide storage problems, buy only enough of the pesticide to last through the use season. Mix only the amount of pesticide that is needed for the immediate application.

Posting and Notification

Local law may require schools to notify students and staff of impending pesticide applications. The school system may take the responsibility to inform school staff and students' parents of upcoming pesticide treatments. When good IPM practices are followed, concerns raised by notification and posting activities will be minimized. If notification and posting is a new practice at the school, the new policy should be explained so it will not be misinterpreted to imply that more pesticides are being applied.

Advance notification can be accomplished by posting signs around the school, sending notices home with students or by another practical method. Schools should consider posting notices in areas to be treated or that have been treated. The school pest manager should be prepared and be available to provide more specific information to concerned parents and others.

A voluntary registry of individuals who are adversely affected by exposure to pesticides can be kept at the school. Information on how to contact the local poison control center and emergency personnel should be kept accessible.

STEP 7

Evaluating Results and Record-keeping

Successful practice of IPM relies on accurate record-keeping. It allows the school to evaluate the results of practicing IPM to determine if pest management objectives have been met. Keeping accurate records also leads to better decision making and more efficient procurement. By keeping accurate records on inspecting, identifying and monitoring, results can be recorded showing changes in the site environment (less available food, water or shelter), physical changes (exclusion and repairs), pest population changes (increased or reduced, older or younger pests) or changes in the amount of damage or loss.

A complete and accurate pest management log should be maintained for each property and be kept in the office of the Pest Manager. Pesticide use records should also be maintained to meet any requirements of the state regulatory agency, school board and applicable local regulations. The log book should contain the following items:

- A copy of the Pest Management Plan and service schedule for the property.
- A copy of the current EPA-registered label and the current MSDS for each pesticide product used on school property.
- Pest surveillance data sheets that record in a systematic fashion the type and number of pests or other indicators of pest population levels revealed by the monitoring program for the site. Examples include: date, number, location and rodent species trapped or carcasses removed; and date, number and location of new rat burrows observed.
- A diagram noting the location of pest activity including the location of all traps, trapping devices and bait stations in or around the site.

EVALUATING THE COSTS

Long-term costs of IPM may be less than a conventional pest control program that relies solely on the use of pesticides. However, the long-term labor costs for IPM may be higher than those for conventional pesticide treatments. The labor costs may be offset by fewer service calls for the pest manager and reduced expenditures for materials.

Whether an IPM program raises or lowers costs depends in part on the nature of the current housekeeping, maintenance and pest management operations. The costs of implementing an IPM program can also depend on whether the pest management services are contracted, performed in-house or both. To fit the IPM program into the existing budgetary framework, school administrators must consider the additional and redistributed expenditures. ***As with any program, insufficient resources will jeopardize the success of IPM.***

Potential Added Costs

Initiating an IPM program may require repair and maintenance activities to prevent pest entry and to eliminate sources of shelter, food and moisture. Examples of these one-time expenses that may pay back with future budgetary savings include:

- Improving waste management by moving trash or garbage containers away from school buildings to reduce the opportunity for pest invasion. This cost is a one-time expense that will result in fewer pest problems and reduce the need for other pest control procedures.
- Installing physical barriers such as air curtains over the outside entrances to kitchens to reduce flying insect problems. (However, these devices *do* require maintenance to operate properly and these long-term costs need to be considered.)
- Stepping up structural maintenance to correct such situations as leaky pipes reduces future maintenance problems, prevents pest problems and saves money in the long-term.
- Training staff in IPM. The amount of information necessary to implement IPM is greater than that required for conventional pest control. Consequently, training staff in IPM will likely result in increased costs.
- Re-landscaping the area next to buildings to discourage pests.

In the long-run, these repair and maintenance activities will reduce overall costs of the pest control operation, as well as other maintenance and operating budgets. Whether these costs are actually budgeted as a pest control expense or under some other budgetary category depends on the budgetary format of the school system. School systems with an active maintenance and repair program may be able to absorb these activities within the current budget.

Procurement

Successful practice of IPM relies on accurate record-keeping and efficient procurement. As the IPM program progresses, predictable events and pest control needs will be identified. Close consultation with the pest management specialist is essential for making good budget decisions.

Some non-pesticidal products, such as traps, can be stocked to reduce purchases in future years, but few savings can be realized by purchasing pesticides in bulk. It is probably best to keep no more than a 60-day pesticide inventory to assure product freshness. Pest managers should be able to anticipate needs to fit a 60-day buying schedule.

"In-house" or Contracted Services

IPM programs can be successfully implemented by "in-house" school employees or by contracting with a pest control company. A combination of in-house and contracted functions may be mixed and matched to the needs and capabilities of the school system. Both approaches have advantages and disadvantages and individual school systems must decide what is best for them. Whether you choose in-house or contracted services, pest management personnel should be trained to:

- Understand the principles of IPM.
- Identify pests and associated problems or damage.
- Monitor infestation levels and keep records.
- Know control through changing human habits that encourage pests (cultural control), mechanical or alternative methods.
- Know recommended methods of judicious pesticide application.
- Know the hazards of pesticides and the safety precautions to be taken.
- Be familiar with the pesticide label's precautionary statements pertaining to exposure to humans or animals.

"In-house" Services

One of the most important tasks for an in-house program is training staff to function within an IPM context. Assistance can be obtained from the previously mentioned agencies.

Contracted Services

Pest control firms should work with the responsible school official to solve pest control problems. Using an outside pest control firm may cost more initially but this method does eliminate the need to hire and train personnel, store pesticides and maintain specialized liability insurance. The contract should specify the use of IPM principles and practices in meeting pest management objectives. [See Appendix II for an example pest management contract.]

The pest management services contract should include IPM specifications. Contracts should be written to provide expected results. Pest management objectives specific to the site should be jointly developed, agreed upon and written into the contract. Any special health concerns (such as those for old or young persons, pets or individuals who are allergic, etc.) should be noted and reflected in the pesticides that can be utilized, or excluded from use.

When choosing a pest control firm, check with local Better Business Bureaus regarding any complaints they have received about a pest control company. State regulatory agencies can also provide information on pesticide applicator certification.

SOURCES FOR MORE INFORMATION

For additional copies of this document, contact: Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761 (217-782-5830; *TDD Phone*: 800-547-0466, for the hearing impaired *ONLY*).

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For information about pesticides, contact the National Pesticide Telecommunications Network, toll-free at 800-858-7378 (*TDD Phone is the same number*), Monday through Friday. Operators are available to provide the medical, veterinary and professional communities and the public with:

- Information on recognizing and managing pesticide poisonings;
- Referrals for laboratory analyses, investigation of pesticide incidents and emergency treatment information;
- Tips for using pesticides correctly;
- Clean-up and disposal procedures; and
- Much more.

General Information on IPM:

Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761 (217-782-5830; *TDD Phone*: 800-547-0466, for the hearing impaired *ONLY*)

Bio-Integral Resource Center (BIRC), P.O. Box 7414, Berkeley, CA 94704

Illinois Pest Control Association, 3230 Sprucewood Lane, Wilmette, IL 60091 (708-251-1001)

National Pest Control Association, 8100 Oak St., P.O. Box 377, Dunn Loring, VA 22027 (703-573-8330)

University of Illinois Cooperative Extension Service, 172 Natural Resources Building, 607 E. Peabody Dr., Champaign, IL 61820 (217-333-6652; *TDD Phone*: 217-244-6677)

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CORRESPONDENCE COURSES

Individuals may wish to take one of the following correspondence courses to increase their expertise in IPM.

Pest Control Correspondence Course. Continuing Education Business Office, 1586 Stewart Center, Room 110, Purdue University, West Lafayette, IN 47907-1586.

Vector-Borne Disease Control -- No. 3013-G. [Although the emphasis is on control of pests of public health importance, the materials for this course contains much information on the management of structural pests.] Centers for Disease Control and Prevention, Self Study Office, Building 2, Room B-50, FO2, 1600 Clifton Rd., NE, Atlanta, GA 30333.

This policy statement is for information only; it should not be considered to be an "official" Illinois Department of Public Health policy statement on IPM in schools.

Appendix I

Example School Pest Management Policy Statement

SCHOOL PEST MANAGEMENT POLICY STATEMENT

Structural and landscape pests can pose significant hazards to people, property and the environment. Pesticides can also pose hazards to people, property and the environment. It is therefore the policy of this School District to incorporate Integrated Pest Management (IPM) procedures for control of structural and landscape pests.

Pests

Pests are populations of living organisms (animal, plants or microorganisms) that interfere with the human purposes for the school site. Strategies for managing pest populations will be influenced by the pest species and any threat they pose to people, property or the environment.

Pest Management

Pests will be managed to:

- Reduce any potential human health hazard or to protect against a significant threat to public safety;
- Prevent loss or damage to school structures or property;
- Prevent pests from spreading in the community or to plant and animal populations beyond the site;
- Enhance the quality of life for students, staff and others.

[Proposed pest management measures must be included in a pest management plan for the site.]

Integrated Pest Management Procedures

IPM procedures will determine when to control pests and whether to use mechanical, physical, chemical, cultural or biological means. IPM practitioners depend on current, comprehensive information on the pest and its environment and the best available pest control methods. Applying IPM principles prevents unacceptable levels of pest activity and damage by the most economical means and with the least possible hazard to people, property and the environment.

The choice of using a pesticide will be based on a review of all other available options and a determination that these options alone are not acceptable or not feasible. Selected non-chemical pest management methods will be implemented whenever possible. It is the policy of this School District to utilize IPM principles to manage pest populations adequately. The full range of alternatives, including no action, will be considered.

When it is determined that a pesticide must be used to meet important management goals, the least hazardous* material will be chosen. The application of such pesticides is subject to the Federal Insecticide, Fungicide and Rodenticide Act (7 USC 136 et seq.), School District policies and procedures, U.S. Environmental Protection Agency (USEPA) regulations in 40 CFR, Occupational Safety and Health Administration regulations, and state and local regulations.

Education

Staff, students, pest managers and the public will be educated about potential school pest problems and the IPM policies and procedures to be used to achieve the desired pest management objectives.

Record-keeping

Records of pesticide use shall be maintained on site to meet the requirements of the state regulatory agency and School Board. Records must be current and accurate if IPM is to work. Additionally, pest surveillance data sheets, which record the number of pests or other indicators of pest populations, are to be maintained to verify the need for treatments.

Notification

This School District takes the responsibility to notify students' parents or guardians and the school staff of upcoming pesticide treatments. Notices will be posted in designated areas at school and sent home with students.

Pesticide Storage and Purchase

Pesticide purchases will be limited to the amount authorized for available use during the year. Pesticides will be stored and disposed of in accordance with the USEPA-registered label directions and state regulations. Pesticides must be stored in an appropriate, secure site not accessible to students or unauthorized personnel.

Pesticide Applicators

Pesticide applicators must be educated and trained in the principles and practices of IPM and the use of pesticides approved by this School District, and they must follow regulations and label precautions. The School District requires that applicators be certified and comply with this School District IPM policy and Pest Management Plan.

*Precautionary statements are required on all pesticide labels. Signal words on each label indicate the level of acute toxicity of the pesticide product (see below). The chronic toxicity is not indicated on the label. Every label bears the child hazard warning: Keep Out Of Reach Of Children.

DANGER - A taste to a teaspoonful taken by mouth could kill an average-sized adult.

WARNING - A teaspoonful to an ounce taken by mouth could kill an average-sized adult.

CAUTION - An ounce to over a pint taken by mouth could kill an average-sized adult.

*These specifications were developed for the General Services Administration of the U.S. government. They are provided **for information only**; they should **not** be considered to be "**official**" Illinois Department of Public Health specifications for IPM in schools.*

Appendix II.

Example Pest Management Specifications

General Services Administration
Public Buildings Service

Specification No. BM-5-1
January 1993

Superseding Specification No. BM-5-1
January 1989

SPECIFICATION

PEST CONTROL

-01 GENERAL

a. Description of Service: This contract is part of a comprehensive Integrated Pest Management (IPM) program for the buildings and other areas specified herein. IPM is a process for achieving long term, environmentally sound pest suppression through the use of a wide variety of technological and management practices. Control techniques in an IPM program extend beyond the application of pesticides to include structural and procedural modifications that reduce the food, water, harborage, and access used by pests.

The Contractor shall furnish all supervision, labor, materials, and equipment necessary to accomplish the surveillance, trapping, and pesticide application components of the IPM program. The Contractor shall also provide detailed, site-specific recommendations for structural and procedural modifications necessary to achieve pest prevention.

b. Pests Included and Excluded: The Contractor shall adequately suppress indoor populations of rats, mice, cockroaches, ants, flies, and any other arthropod pests not specifically excluded from the contract. Populations of these pests that are located outside of the specified buildings, but within the property boundaries of the buildings, are included.

Populations of the following pests are excluded from this contract:

- Birds, bats, snakes, and all other vertebrates other than commensal rodents.
- Termites and other wood-destroying organisms.
- Mosquitoes.
- Pests that primarily feed on outdoor vegetation.

However, the following shall be controlled under the terms of the contract:

- Individuals of all the above pests that are incidental invaders inside buildings.
- Winged termite swarmers emerging indoors.

c. Initial Inspection: The Contractor shall conduct a thorough, initial inspection of each building or site within ten (10) working days after the effective date of the contract. The purpose of the initial inspection is for the Contractor to identify problem areas and any equipment, structural features, or management practices that are contributing to pest infestations.

Access to building space shall be coordinated with the Contracting Officer's Representative (COR). The COR will inform the Contractor of any restrictions or areas requiring special scheduling.

d. Pest Control Plan: Prior to initiation of service, the Contractor shall submit to the COR a Pest Control Plan for each building or site within ten (10) working days following the initial inspection. Upon receipt of the Pest Control Plan, the COR will render a decision regarding its acceptability within five (5) working days. The Contractor shall be on site to initiate service within five (5) working days following notice of approval. If aspects of the Pest Control Plan are incomplete or disapproved, the Contractor shall have three (3) working days to submit revisions.

The Pest Control Plan shall consist of four parts:

1. Proposed methods for control, including labels and Material Safety Data Sheets (MSDS sheets) for all pesticides to be used. A list of brand names of rodent bait boxes, insect and rodent trapping devices, pest monitoring devices, and any other control devices or equipment should also be included.

2. A service schedule for each building or site. Frequency of Contractor visits shall depend on the specific pest control needs of each premise. At the minimum, the Contractor shall conduct inspections monthly to determine if treatment is required. The Government will consider weekly service to be the standard for large office buildings with a history of pest infestation.

3. A description of any structural or operational changes that would facilitate the pest control effort.

4 A copy of the Commercial Pesticide Applicator Certificate or License for every Contractor's representative who will be performing on-site service under this contract. At the minimum, the Contractor shall submit the Certificates of two individuals, one acting as a regular service representative and the other acting as an alternate.

It shall be the Contractor's responsibility to carry out work according to the approved Pest Control Plan for each building or site. The Contractor shall receive the concurrence of the COR prior to implementing any subsequent changes to the approved Pest Control Plan, including additions or replacements to the pesticide list and to on-site service personnel.

e. Pesticide Application: The Contractor shall not apply any pesticide product that has not been included in the Pest Control Plan or approved in writing by the COR.

Pesticide application shall be according to need and not by schedule. As a general rule, application of pesticides in any area inside or outside the premises shall not occur unless visual inspections or monitoring devices indicate the presence of pests in that specific area.

Preventive pesticide treatments of areas where inspections indicate a potential insect or rodent infestation are acceptable on a case-by-case basis. Written approval must be granted by the COR prior to any preventive pesticide application.

The Contractor shall not store any pesticide product on Government property.

f. Structural / Procedural Recommendations: Structural modifications for pest control, including the application of caulk and other sealing materials, will not be the responsibility of the Contractor. However, throughout the life of this contract, the Contractor shall be responsible for notifying the COR in writing about any structural, sanitary, or procedural modifications deemed necessary to eliminate pest food, water, harborage, or access.

g. Record Keeping: The Contractor shall be responsible for maintaining a pest control logbook or file for each building or site specified in this contract. These records shall be kept on Government property and maintained on each visit by the Contractor.

Each logbook or file shall contain at least the following items:

- A copy of the Pest Control Plan for the building or site, including labels and MSDS sheets for all pesticides used in the building, brand names of all pest control devices and equipment used in the building, and the Contractor's service schedule for the building;

- The field office copies of GSA Form 3638, Pest Control Work and Inspection Report, or an equivalent. These forms will be supplied to the Contractor by the COR, and will be used to advise the Contractor of routine service requests and to document the performance of all work, including emergency work. Upon completion of a service visit to the building, the Contractor's representative performing the service shall complete, sign, and date the Form 3638, and return it to the logbook or file on the same or succeeding day of the services rendered; and

- The Contractor's Service Report forms, documenting all information on pesticide application required by statute in the jurisdiction where service is actually performed. These forms shall not be mandatory if all required information on pesticide application is included on the Government's Pest Control Work and Inspection Report.

h. Contractor Personnel: Throughout the life of this contract, all Contractor personnel providing on-site pest control service must meet state and local requirements in the jurisdiction(s) where service is actually performed, for training, registration, or certification as Commercial Pesticide Applicators in the category of Industrial, Institutional, Structural, and Health Related Pest Control. Uncertified individuals working under the supervision of a Certified Applicator will not be permitted to provide service under the terms of this contract.

i. Manner and Time to Conduct Service: The Contractor shall perform routine pest control services that do not adversely affect tenant health or productivity during the regular hours of operation in buildings. When it is necessary to perform work outside of the regularly scheduled hours set forth in the Pest Control Plan, the Contractor shall notify the COR at least one day in advance.

The Contractor shall observe all safety precautions throughout the performance of this contract. Certain areas within some buildings may require special instructions for persons entering the building. Any restrictions associated with these special areas will be explained by the COR. The Contractor shall adhere to these restrictions and incorporate them into the Pest Control Plan for the specific building or site. The following areas are restricted:

All Contractor personnel working in or around buildings designated under this contract shall wear distinctive uniform clothing. The Contractor shall determine and provide additional personal protective equipment required for the safe performance of work. Protective clothing, equipment, and devices shall, as a minimum, conform to Occupational Safety and Health Administration (OSHA) standards for the products being used. Vehicles used by the Contractor shall be identified in accordance with state and local regulations.

j. Special Requests and Emergency Service: On occasion, the COR may request that the Contractor perform corrective, special, or emergency service(s) that are beyond routine service requests. The Contractor shall respond to these exceptional circumstances and complete the necessary work within one (1) working day after

receipt of the request. In the event that such services cannot be completed within one working day, the Contractor shall immediately notify the COR and indicate an anticipated completion date.

-02 INSECT CONTROL

a. Non-pesticide Products and Use: The Contractor shall use non-pesticide methods of control wherever possible. For example:

- Portable vacuums rather than pesticide sprays shall be used for initial cleanouts of cockroach infestations, for swarming (winged) ants and termites, and for control of spiders in webs wherever appropriate.

- Trapping devices rather than pesticide sprays shall be used for indoor fly control wherever appropriate.

- Sticky traps shall be used to guide and evaluate indoor pest control efforts wherever necessary.

b. Pesticide Products and Use: When it is determined that a pesticide must be used in order to obtain adequate control, the Contractor shall employ the least hazardous material, most precise application technique, and minimum quantity of pesticide necessary to achieve control.

The Contractor shall be responsible for application of pesticides according to the label. All pesticides used by the Contractor must be registered with the Environmental Protection Agency (EPA), state and/or local jurisdiction. Transport, handling, and use of all pesticides shall be in strict accordance with the manufacturer's label instructions and all applicable Federal, state, and local laws and regulations.

The Contractor shall minimize the use of liquid pesticide applications wherever possible. For example:

- Containerized and other types of bait formulations rather than sprays shall be used for cockroach and ant control wherever appropriate. The Government will consider bait formulations to be the standard for typical office space.

- As a general rule, liquid, aerosol, or dust formulations shall be applied only as crack and crevice treatments with application devices specifically designed or modified for this purpose. "Crack and crevice treatment" is defined in this contract as an application in which the stream of pesticide is never visible.

- Application of pesticide liquid, aerosol, or dust to exposed surfaces, and pesticide space sprays (including fogs, mists, and ultra-low volume applications), shall be restricted to unique situations where no alternative measures are practical.

The Contractor shall obtain the approval of the COR prior to any application of pesticide liquid, aerosol, or dust to exposed surfaces, or any space spray treatment. The Contractor shall take all necessary precautions to ensure tenant and employee safety, and all necessary steps to ensure the containment of the pesticide to the site of application. Other than crack and crevice treatments, no liquid, aerosol, or dust applications shall be made while tenant personnel are present.

-03 RODENT CONTROL

a. Non-pesticide Products and Use: As a general rule, rodent control inside occupied buildings shall be accomplished with trapping devices only. All such devices shall be concealed out of the general view and in protected areas so as not to be affected by routine cleaning and other operations. Trapping devices shall be checked on a schedule approved by the COR. Trapping shall not be performed during periods when maintenance will be delayed by holidays, weekends, etc. The Contractor shall be responsible for disposing of all trapped rodents and all rodent carcasses in an appropriate manner.

b. Pesticide Products and Use: In exceptional circumstances, when rodenticides are deemed essential for adequate rodent control inside occupied buildings, the Contractor shall obtain the approval of the COR prior to making any interior rodenticide treatment.

All rodenticides, regardless of packaging, shall be placed either in locations not accessible to children, pets, wildlife, and domestic animals, or in EPA-approved tamper-resistant bait boxes.

Frequency of bait box servicing shall depend upon the level of rodent infestation. All bait boxes shall be maintained in accordance with EPA regulations, with an emphasis on the safety of non-target organisms. The Contractor shall adhere to the following five points:

1. All bait boxes shall be placed out of the general view, in locations where they will not be disturbed by routine operations.

2. The lids of all bait boxes shall be securely locked or fastened shut.

3. All bait boxes shall be securely attached or anchored to the floor, ground, wall, or other surface, so that the box cannot be picked up or moved.

4. Bait shall always be placed in the baffle-protected feeding chamber of the box and never in the runway of the box.

5. All bait boxes shall be labelled with the Contractor's business name and address, and dated at the time of installation and each servicing.

As a general rule, rodenticide application outside buildings shall emphasize the direct treatment of rodent burrows wherever feasible. The Contractor shall be responsible for notifying the COR about the location of all rodent burrows on the premises that must be filled.

-04 PROGRAM EVALUATION

GSA reserves the right to evaluate the progress of this contract in terms of effectiveness and safety, and to require such changes as are necessary. The Contractor shall take prompt action to correct all identified deficiencies.

-05 QUALITY CONTROL PROGRAM

The Contractor shall establish a complete quality control program to assure the requirements of the contract are provided as specified. Within five (5) working days prior to the starting date of the contract, the Contractor shall submit a copy of his program to the Contracting Officer. The program shall include, but not be limited to the following:

- An inspection system covering all the services stated in this contract. A checklist used in inspecting contract performance during regularly scheduled or unscheduled inspections. The name(s) of the individual(s) who will perform the inspections.

- The checklist shall include every area of the operation serviced by the Contractor as well as every task required to be performed.

- A system for identifying and correcting deficiencies in the quality of services before the level of performance becomes unacceptable and/or the Government inspectors point out the deficiencies.

- A file of all inspections conducted by the Contractor and the corrective actions taken. This documentation shall be maintained locally and made available to the Government during the term of the contract, and until such time that final payment is made.

-06 SAFETY AND HEALTH

a. All work shall comply with the applicable requirements of 29CFR 1910/1926 and 40CFR 761 and the GSA Supplement to Masterspec, Safety and Health. All work shall comply with applicable state and municipal safety and health requirements. Where there is a conflict between applicable regulations, the most stringent will apply.

b. The Contractor shall assume full responsibility and liability for compliance with all applicable regulations pertaining to the health and safety of personnel during the execution of work, and shall hold the Government harmless for any action on its part or that of its employees or subcontractors, that results in illness or death.

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